ATMOSPHERE

SERVICE MANUAL

The instructions in this handbook must be followed in detail step by step. Negligence can cause serious injury or even death.

Special warnings are marked with this symbol

Servicing must only be carried out by persons who have been trained and certified by Poseidon.

Only Poseidon original parts may be used for servicing. Where stated, Poseidon original tools must be used.

2. INTRODUCTION

MARKINGS

This manual contains servicing and repair instructions and product information for the Poseidon Atmosphere Full Face Mask. The picture below show where to find the article and serial number:

- EN 250 — Meets or exceeds requirements in EU Directive 89/686/EEC, Personal Protective Equipment.
- CE 0120 — Manufacturing assessment carried out by notified body SGS Yarsley, ID no. 0120.
- 4950-M-BK — Model identification
- E.g 200001 — Serial number, 7 digit, 1st digit denotes year of manufacture
- WP 300bar — Working pressure 300 bar

SERVICE

This servicing handbook is available for download at http://extranet.poseidon.com. Make sure you have the latest issue before undertaking any servicing. The handbook is available in English

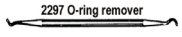
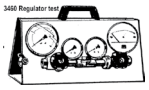
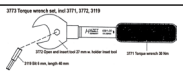
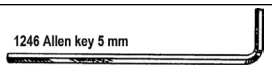
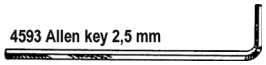
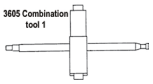
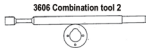
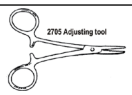
Further assistance can be reached between 8:00 am to 4:30 pm (GMT+1) at Poseidon Diving Systems:
Ph. +46 (0)31 7342900 ask for “technical assistance”
Fax +46 (0)31 7342901
e-mail: info@poseidon.com

SYMBOLS USED THROUGHOUT THE HANDBOOK

Icon	Description	Other information
	Remove old part. Destroy and give back to customer	
	Replace with new part	
	Visually inspect	
	Poseidon grease #R, article no 8516	
	Warning. Negligence can cause serious injury or even death.	

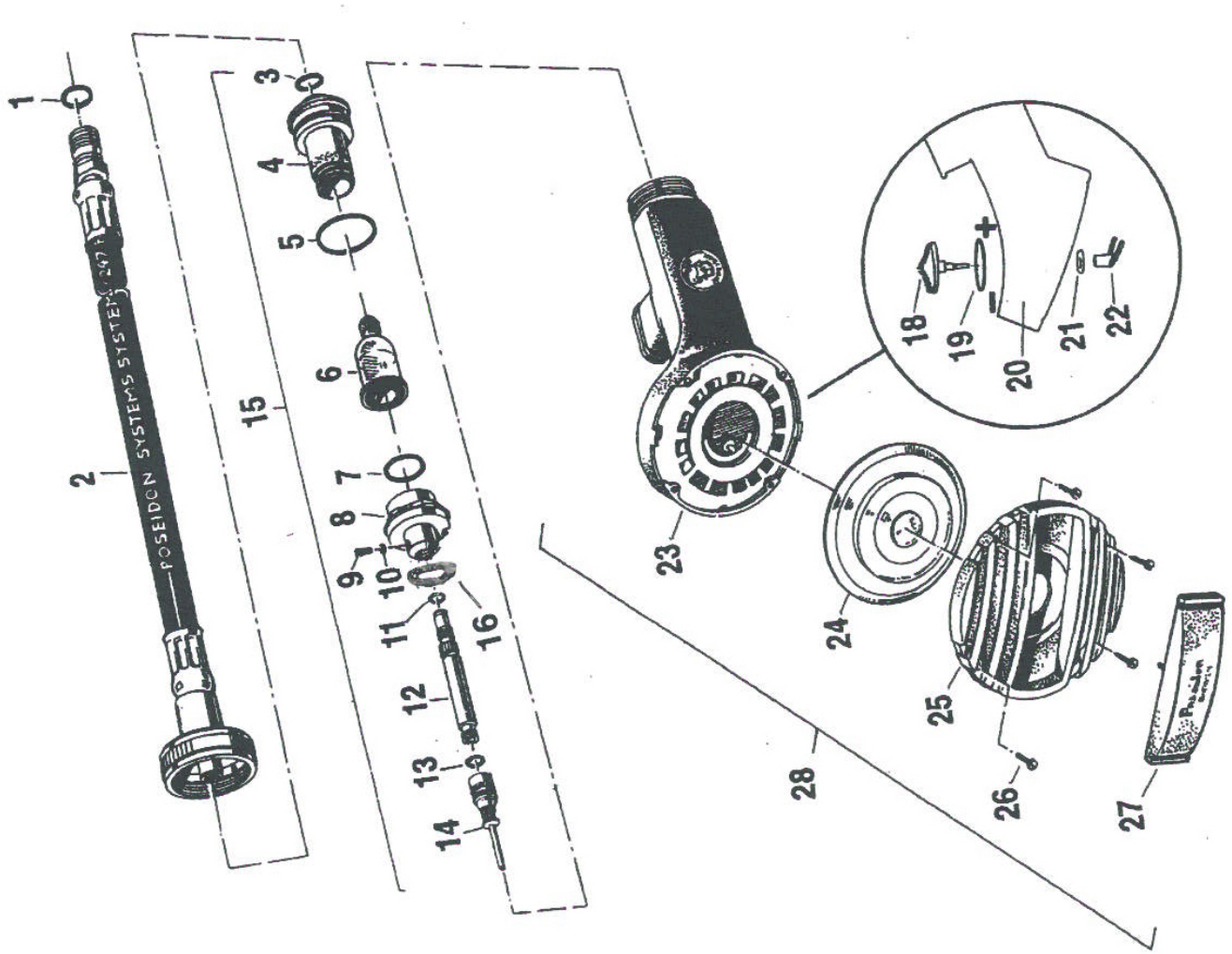
3. TOOLS AND TOOL ORDER FORM

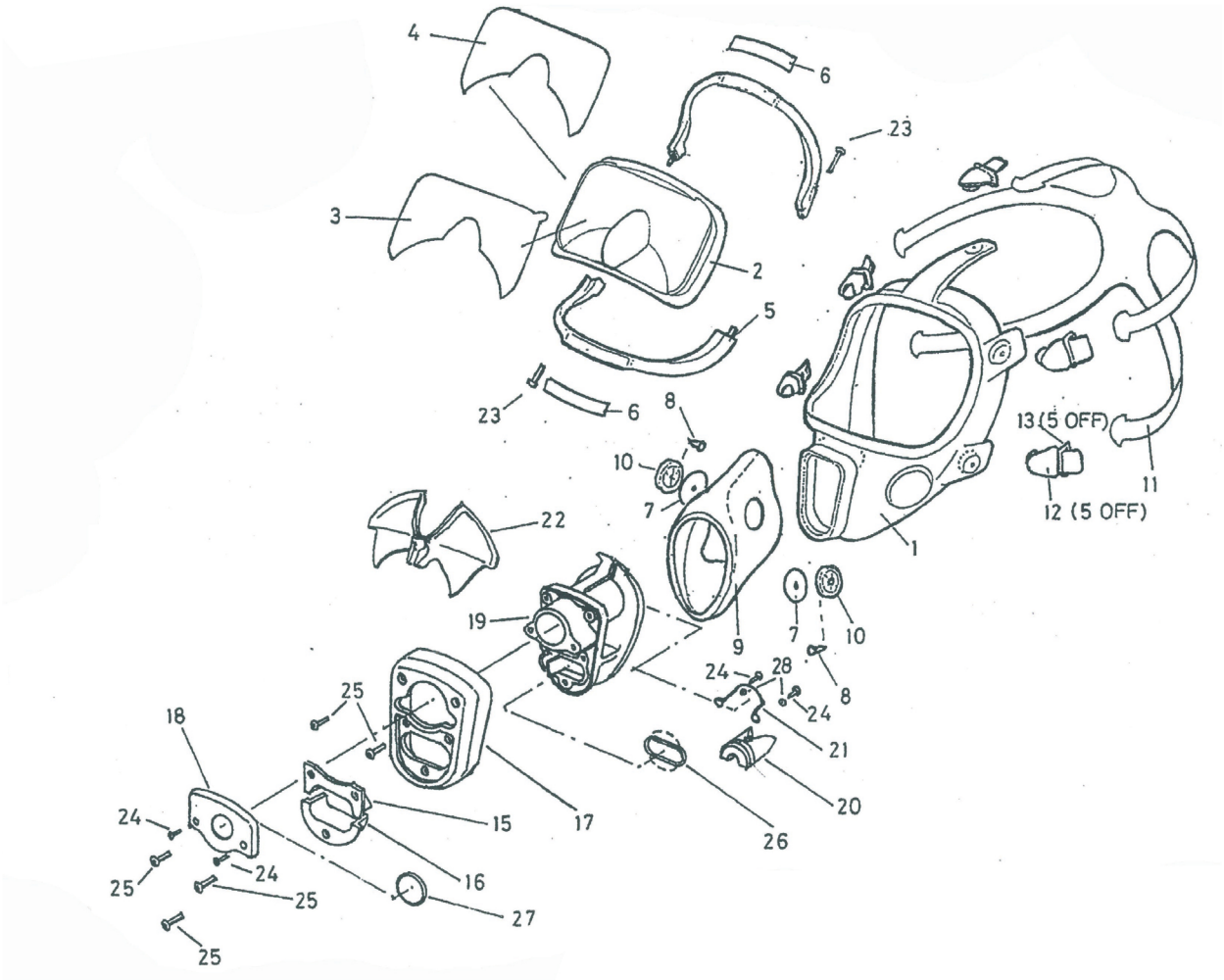
To service Poseidon regulators there is a number of tools required. Some of the tools are special tools for Atmosphere and Poseidon and some other tools are standard tools available in most hardware stores. Below you will find a list of all tools needed, with a description of what it is used for. Whenever you need to order a special Poseidon tool it is a good idea to copy this page and use it as an order form. Fill in the number of tools required and fax it to the Poseidon distributor in the country where you are situated. Do not forget to write the name of your shop in the head of this page.

Item	Description	Atmosphere	Xstream	Jetstream	Cyklon	Valves	Picture	Ord. qty
2297 O-ring remover	Used to remove o-rings.	o	o	o	o	o		
3460 Regulator test	Used to check or finally adjust the regulator.	o	o	o	o			
3773 Torque wrench set	Used to set the torque on various parts of the regulator.		o	o	o			
1246 Allen key 5 mm	Used to unscrew blindplugs and to adjust IP on Xstream.		o	o	o			
2706 Allen key 1,5 mm	Used to untighten and tighten the locking screw on Jetstream and Xstream valve tube and stopscrews on most first stages.	o	o	o	o			
4593 Allen Key 2,5 mm	Used to unscrew and screw the three screws that hold the 2nd stage in place.							
3605 Combination tool 1	Used to to screw and unscrew various parts on the first stage and second stages.	o	o	o	o			
3606 Combination tool 2	Used to to screw and unscrew various parts on the first stage and second stages.	o	o	o	o			
2705 Adjusting tool	Used to adjust the cracking pressure on Jetstream and Xstream.	o	o	o				
Articles of consumption								
8516 Regulator grease	Used for lubrication of air version regulators.	o	o	o	o	o		
3139 Oil silicone 20 g	Used for lubrication of air version regulators.				o			

4. SPARE PARTS & SERVICE KITS

Pos.	Part	Material
1	0010-353 (2782) O-ring	NBR
2	2943 Low pressure hose w safety valve, 70cm UNF 3/8"	Rubber/Brass
2	2944 Low pressure hose w safety valve, 90cm UNF 3/8"	Rubber/Brass
3	0010-355 (2856) O-ring	NBR
4	2857 Low pressure valve housing	Brass
5	0010-025 (1145) O-ring	NBR
6	3440 Valve insert	Silicone/Acetal
7	0012-007 (1233) O-ring	NBR
8	4951 Valve housing nut	Brass
9	2875 Stop screw	Stainless steel
10	2787 Rubber plate	PUR
11	0015-019 (2876) O-ring	NBR
12	4902 Valve tube	Brass
13	0010-002 (1896) O-ring	NBR
14	4545 Servo valve	Brass/SS/PU
15	4914 Low pressure valve incl. 3-15	-
16	4952 Check valve	Silicone
18	2711 Switch	POM
19	0010-018 (1851) O-ring	NBR
20	4909 Housing	ASA
21	2794 Lock washer	Stainless steel
22	2712 Diaphragm cam	POM
23	3122 Housing second stage incl. 18-22, black	-
24	2578 Diaphragm	Silicone
25	2707 Cover for second stage, black	ASA
26	2851 Screw (4pcs)	Stainless steel
27	2853 Purge button	Rubber





Pos.	Part	Material
1	4939-M-BK Outer Mask Standard	Silicone
2	4916 Dive visor	Polycarbonate
3	4946 Visor guard plain dive	PVC
4	4917 Anti fog film dive	PVC
5	4918 Visor clamp (2pcs)	Glass filled nylon
6	4922 Decal lens (2 pcs)	Polycarbonate
7	4934 Front fitting inhale flap (2 pcs)	Polycarbonate
8	4937 Pin (inhale valve) (2 pcs)	Glass filled nylon)
9	4932-BK Inner mask medium	Silicone
10	4933 Inner mask inhale (2 pcs)	Polycarbonate
11	4940 Head harness	Chloroprene
12	4941 Head harness buckle (5 pcs)	Glass filled nylon
13	4941 Head harness strap retainer (5 pcs)	Glass filled nylon
14	4540 Neck strap	Silicone
15	4926-T Regulator clamp top	Acetal Copolymer
16	4926-B Regulator clamp bottom	Acetal Copolymer
17	4929 Front cover dive	Acetal Copolymer
18	4923 Dive coms plug	Acetal Copolymer
19	4930 Front block dive	Acetal Copolymer
20	4935 Valsava nose block	Neoprene
21	4936 Valsava wire attachement	Stainless steel
22	4931 Air deflector ducts	Silicone
23	4918 Screw M3x20 LG (2 pcs)	Stainless steel
24	4925 Screw M3x8 LG (4 pcs)	Stainless steel
25	4928 Screw M4x16 LG (5 pcs)	Stainless steel
26	4927 O-ring ⚠	Nitrile
27	4924 O-ring See note below	Nitrile

Note: If Interspiro compatible communication device is used with the mask, use 4959-0-NR-7 O-ring instead.

SERVICEKITS

3549 Servicekit Jetstream 2nd stage			
Included:	0010-025	O-ring	1 pcs
	0012-007	O-ring	1 pcs
	0010-002	O-ring	1 pcs
	2787	Rubber plate	1 pcs
	0010-355	O-ring	1 pcs
	0015-019	O-ring	1 pcs
	1167	Strap	1 pcs

Additional part(s) needed			
	4952	Check valve	1 pcs

NOTE!

When replacing the Jetstream PP 2nd stage housing, on masks/2nd stages manufactured in 2008 and earlier, part number 3122 is to be used and NOT part number 4911.

When 2nd stage houing part number 3122 is used, diaphragm with part number 4907 MUST be replaced with diaphragm 2578.

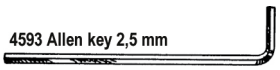
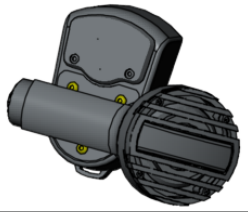
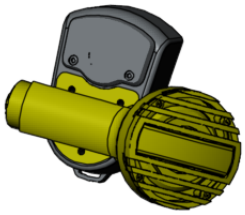
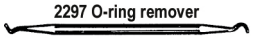
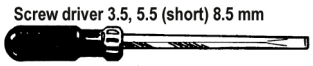
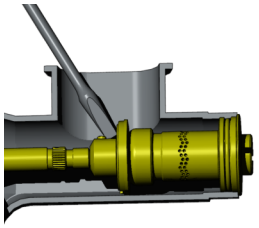
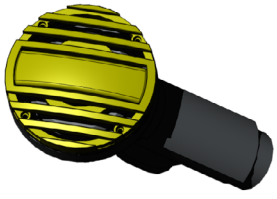
5. SERVICE

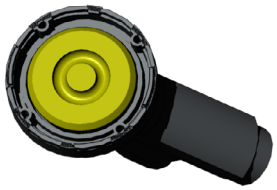
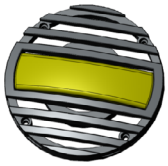
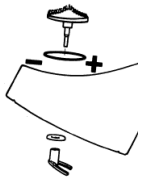
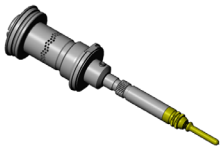
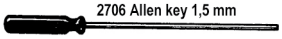
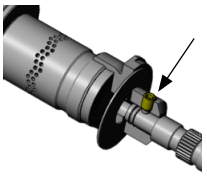
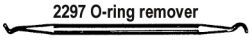
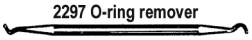
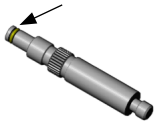
For instructions on how to service the regulator follow the instruction below. The instructions in this handbook must be followed in detail step by step. Negligence can cause serious injury or even death.

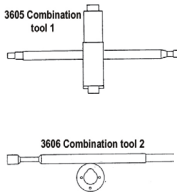
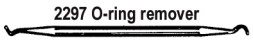
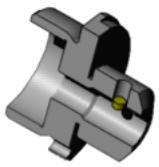
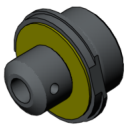
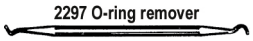
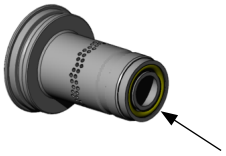
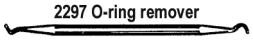
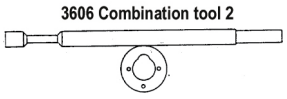
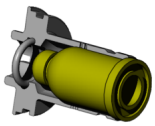
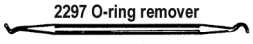
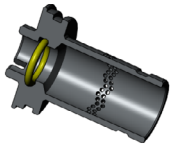
DISASSEMBLY

To remove o-rings, ONLY use o-ring remover tool 2297. Make sure not to damage o-ring and sealing surfaces!!

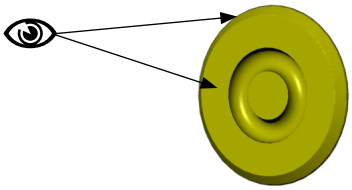
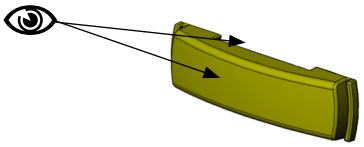
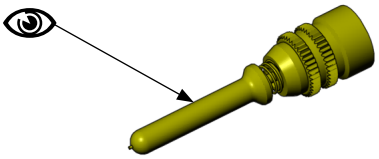
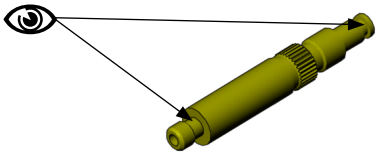
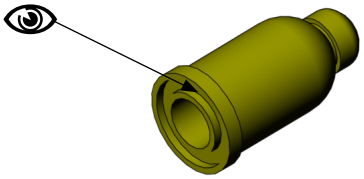
Jetstream PP

Step	Parts	Tools/Instructions		Picture
1	**4928 Screw M4 x 16 LG 3 pcs**	 4593 Allen key 2,5 mm		
2	**Jetstream PP and regulator clamps**	**Pull out**		
3	**4953 Deflector**	**Pull out**		
4	**4927 O-ring**	 2297 O-ring remover		
5	**Valve assembly**	 Screw driver 3.5, 5.5 (short) 8.5 mm		
6	**2851 Screw 4 pcs**	Screw driver Pozi 1		
7	**2707 Cover**	**Remove**		

Step	Parts	Tools/Instructions		Picture
8	**2578 Diaphragm**	**Remove**		
9	**2853 Purge button**	**Remove**		
10	**Switch**	**Do not remove! Unless damaged**		
11	**4545 Servo valve**	**Remove**		
12	**2875 Stop screw**			
13	**4902 Valve tube**	**Remove**		
14	**0010-002 O-ring**			
15	**0015-019 O-ring**			

Step	Parts	Tools/Instructions		Picture
16	**4951 Valve housing nut**			
17	**2787 Rubber plate**			
18	**4952 Check valve**	**Remove**		
19	**0012-007 O-ring**			
20	**0010-025 O-ring**			
21	**3440 Valve insert**			
22	**0010-355 O-ring**			

INSPECTIONS

Step	Parts	Inspect	Picture
1	**2578 Diaphragm**	**1. Check that the sealing surface is even** **2. Check for holes in the diaphragm**	
2	**2853 Purge button**	**1. Make sure there are no cracks** **2. Check to make sure the spring is undamaged**	
3	**4545 Servo valve**	**1. Check to make sure that the valve bar is not bent**	
4	**4902 Valve tube**	**1. Check O-ring sealing surfaces**	
5	**3440 Valve insert**	**1. Ensure no circular cuts on bladder surface.** **2. Check O-ring sealing surface**	
6	**Face mask**	**1. Ensure no cracks, cuts or any signs of wear on mask and sealing surfaces** **2. Make sure there are no cracks or scratches on the visor**	

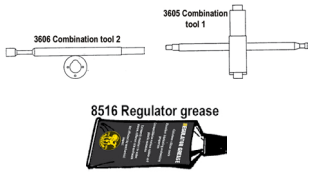
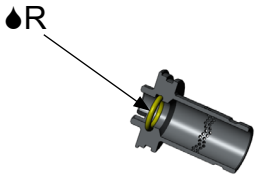
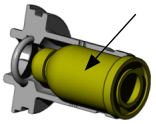
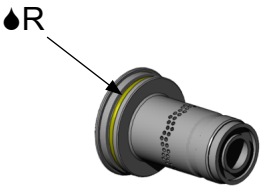
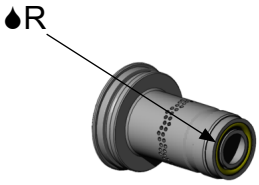
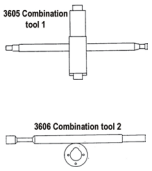
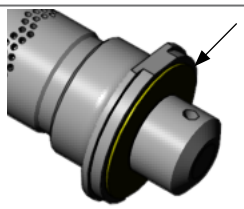
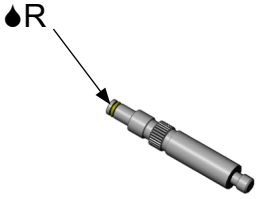
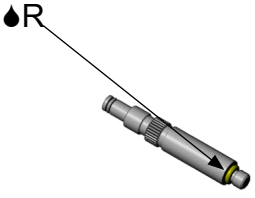
CLEANING

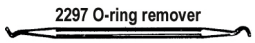
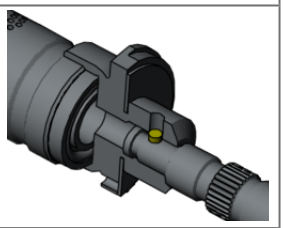
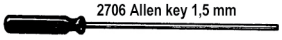
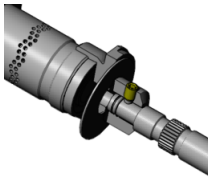
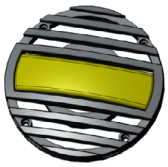
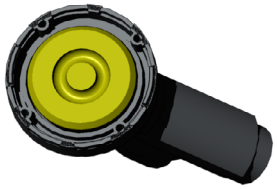
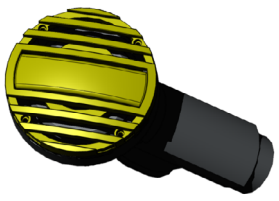
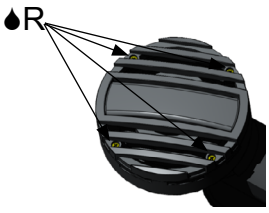
If corrosion or salt deposits occurs on metallic parts, immerse part in concentrated Hempocid* or 15% Hydrochloric acid for about 10 minutes. Then rinse them thoroughly in fresh water and blow them dry with air. The synthetic parts must not be treated with solvents and must only be cleaned with fresh water. The face mask is to be rinsed in fresh water together with the rest of the sythetic parts.

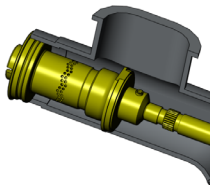
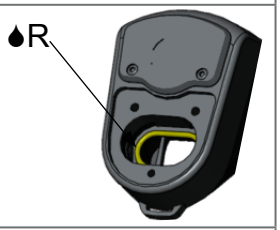
*Hempocid=Acid Liquid detergent containing phosphoric acid (5-10%) and bactericide for disinfectant cleaning

ASSEMBLY

Parts marked with the ↻ symbol are parts that must be replaced at every service. New parts should be stored in it's original packing until it is time for assembly.

Step	Parts	Tools/Instructions		Picture
1	**0010-355 O-ring**			
2	**3440 Valve insert**	**Apply some weak soap solution to surface before inserting the valve insert.** **⚠ Do not use Silicone oil!**		
3	**0010-025 O-ring**			
4	**0012-007 O-ring**			
5	**4951 Valve house nut**			
6	**4952 Check valve**			
7	**0015-019 O-ring**			
8	**0010-002 O-ring**			

Step	Parts	Tools/Instructions		Picture
9	**4902 Valve tube**			
10	**2787 Rubber plate**	 2297 O-ring remover		
11	**2876 Stop screw**	 2706 Allen key 1,5 mm		
12	**4545 Servo valve**	**Firm by hand**		
13	**2853 Purge button**			
14	**2578 Diaphragm**			
15	**2707 Cover**			
16	**2851 Screw 4 pcs**	Screw driver Pozi 1 8516 Regulator grease		

Step	Parts	Tools/Instructions		Picture
17	**Valve assembly**			
18	**4927 O-ring**			
19	**4953 Deflector**	**Slide into place**		

Service procedures for the face mask beyond cleaning are not needed unless damaged components are detected during inspection.
The service procedures that can be applied to the face mask are straight forward and include replacing the visor or changing the head harness. Refer to the Atmosphere users manual for instructions.

The assembly of the 2:nd stage onto the mask is to be conducted after the final settings are applied to the regulator. Refer to Final inspection chapter of this manual

6. FINAL INSPECTION

SETTING, FINAL INSPECTION

Property 2nd stage	Setting SI units	Setting common units	Setting US units
PP (positive pressure)	196 Pa to 343 Pa	20 to 35 mm.w.c	0.8 to 1.4 inch of water

FIRST STAGE SETTING:

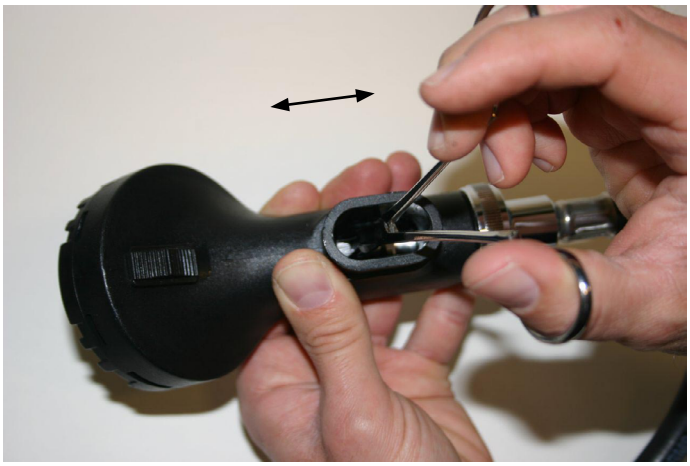
First stage settings, service and adjustment are to be conducted according to the Xstream Service manual.
Intermidiate pressure setting for Xstream 1:st stage when used for the Atmosphere full face mask is 8.5 bar.

SECOND STAGE SETTING:

1) Open either left or right valve, whichever gives the lowest IP
2) Check positive pressure
3) Adjust positive pressure
4) Check bubble flow
5) Close valve
6) Purge.

ADJUSTING POSITIVE PRESSURE:

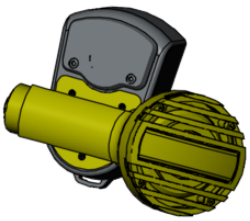
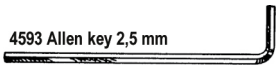
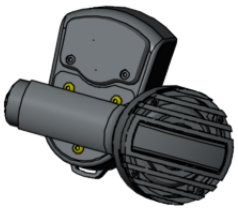
1) Place connection over 2:nd stage opening. Make sure the opening is fully covered. Make sure dive/pre-dive switch is in dive (+) position.
2) Positive pressure reading should be 20-35mmwc
3) If reading is too high unscrew the stop screw and adjust the positive pressure by screwing the valve tube away from the diaphragm. If reading is too low screw the valve tube towards the diaphragm.
4) Switch to pre-dive (-) position
5) Tighten the stop screw
6) Recheck positive pressure reading



CHECKING BUBBLE FLOW:

1) Place thumb over 2:nd stage opening. Make sure dive/pre-dive switch is in dive (+) position
2) Immerse the 2:nd stage fully in water, keep the diaphragm vertical.
3) The regulator may leak a constant and continuous flow of no more than 2-3 tiny bubbles per second from the diaphragm. If flow is too rapid readjust positive pressure according to the above given instructions. If flow is minimal or absent no readjustment is needed.

Assemble the second stage onto the

Parts	Tools/Instructions		Picture
Jetstream PP and regulator clamps	**Mount the second stage according to picture. Do not mount the second stage facing other side!**		
4928 Screw M4 x 16 LG 3 pcs			

7. TECHNICAL DATA

TORQUE TABLE

Part subject to torque wrench use	Newton Meter Nm	Inch Pounds Inch-lbs	Foot Pounds Ft-lbs	Kilogram Meter Kgm
2nd stage	3 +/- 1	27 +/- 5	2.2 +/- 0.4	0.3 +/- 0.05
Hose to 1st stage	6 +/- 1	53 +/- 9	4.4 +/- 0.7	0.6 +/- 0.1
Valve house nut	3 +/- 1	27 +/- 5	2.2 +/- 0.4	0.3 +/- 0.05
Servo valve	Firm by hand	Firm by hand	Firm by hand	Firm by hand
Hose to 2:nd stage	Firm by hand	Firm by hand	Firm by hand	Firm by hand

PRODUCT DATA

General:		
Maximum Operational depth	Certified to 50 m (656 ft)	
Typical Work of Breathing 50m	1.54 J/l	
Approved gas	EN 12021 Air	
Maximum working pressure	300 bar (4351 psi)	
Cold water performance	Exceeding EN 250 requirements for cold water use	
Approvals	Type Approved acc. to EU Directive Personal Protective Equipment 89/686/EEC	
Applicable Performance Standards	EN 136:1998 Mask only NIOSH 84.205 Fit test	
Inner volume	Approx. 0.5 l	
O-ring materials	Jetstream PP	Nitrile, EPDM
Lubricants	Poseidon R	
Warranty	24 months	
2nd stage		
Flow Rate	>1800 l/min STPD (>63 scfm)	
Technique	Upstream servo-valve	
Safety valve opening pressure	18 +/- 1 bar (261 +/- 14 psi)	
Swivelling	Around axis	
Material	ASA, Brass, Silicone, Rubber	
Venturi assist	Automatic	
Inhalation control	Automatic	
Surgical cord	Silicone	
Dismountable w/o tools	Yes	
Hose		
Standard lengths hose	0.7 m (2.3 ft) 0.9 m (3 ft)	
Burst pressure	>100 bar (1450 psi)	
Pull strength	>1000 Newton (225 lbf)	
Material	Reinforced EPDM	
Safety inspection holes	Both ends	
Wear protecting crimps	Both ends	

CONVERSION TABLES

Known	Unknown	Multiply by
Bar	psi	14.5
Psi	bar	0.07
mm.w.c	mbar	0.1
mbar	mm.w.c	10
litre	ft^3	0.0353
ft^3	litre	28.32
m	ft	3.28
ft	m	0.305
Nm	poundfoot	0.7376
Poundfoot	Nm	1.3558

8. TROUBLE SHOOTING

Effect	Examine	Reason	Action
Over pressure valve is opening	Is it only when hose is pulled?	If yes, it is its normal function	None
	Is it spontaneously opening?	If yes, it may be a 1st stage error	Service Level B (according to Xstream service manual)
While diving, small bubbles are coming from the second stage	Is it 2-3 bubbles per second?	This is due to the positive pressure inside the regulator	None
	Is it continuous and rapid flow of bubbles?	If yes, the positive pressure inside the 2nd stage is too high	Adjust the positive pressure
		The diaphragm sealing surface is damaged	Replace the exhalation diaphragm
Outward leakages at extremely cold conditions		Incorrect or damaged ”o”-rings	Service
The IP increases beyond max limit		Damaged HP seat and/or ”o”-ring	Service Level B according to Xstream serive manual
The 2nd stage is hard to adjust to a correct positive pressure	Servo valve	If the servo valve is bent to an angle, its rotation upon the setting procedure will alter the setting, and be self readjusting when used thereafter	Replace servo valve
Sieze of gas	Valve insert 3440 and 1st stage leakage	If the valve insert 3440 has been suppressed to excessive pressure for a longer period of time it can be damaged. Reason being 1st stage failure.	Service Level B (according to Xstream service manual) and replacement of 3440 Valve insert

APPENDIX A

FAQ(T)'S

What shall be used, viton or nitrile?

In short, viton is less likely to ignite but if it does the fumes are extremely toxic. Nitrile is more likely to ignite and releases more heat energy than viton, but the fumes are less toxic. Nitrile has normally better mechanical properties, i.e. it is a better and more reliable seal. Therefore, the risk for, and the consequences of either a failure because of ignition or a loss of seal, determines whether viton or nitrile shall be used.

Upstream valve and sieze of gas?

The servo valve of the Jetstream PP is an upstream opening valve. Because of its small size, an extremely small force is required to crack it open and thereby allow the main valve to open. Even if there is a first stage failure increasing the Interstage pressure, the Interstage pressure will never be greater than twice the originally set IP because of the OPV.

Can I use the Atmosphere with any other first stages then Xstream 1st stage?

No, the Atmosphere full face mask is only approved for usage in conjunction with Xstream 1st stages.

What is the expected service life of the servo valve?

If handled in accordance with the instructions given in the users manual, it is not something that should be expected to need any replacement. The most common problem is ingress of water due to immersion of an unpressurised regulator. In such case, salt crystals can form inside the servo valve and create a minor leakage.

Issue 2

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